ISSN (print) 0093-4666 © 2013. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

http://dx.doi.org/10.5248/123.229

Volume 123, pp. 229–231 *January–March 2013*

Sporisorium linderi, a new record for Asia

Muhammad Fiaz[1*], Abdul Nasir Khalid[2] & Habib Ahmad[3]

[1]*Department of Botany, Hazara University Mansehra, Pakistan*
[2]*Department of Botany, University of the Punjab, Quaid-e-Azam Campus, Lahore, 54590, Pakistan*
[3]*Department of Genetics, Hazara University Mansehra, Pakistan*
* Correspondence to: *muhammadfiazhu@gmail.com*

Abstract — *Sporisorium linderi* (*Ustilaginomycetes*), reported here from Pakistan, is a new record for Asia. *Digitaria ciliaris* is a new host record for smut fungi in Pakistan.

Key words — KPK, *Poaceae*, taxonomy

Introduction

During exploration of smut fungi of Mansehra District, Khyber-Pakhtunkhwa (KPK) Province, Pakistan, *Digitaria ciliaris* was found infected with *Sporisorium linderi*.

The sampling site, located at 34°14′–35°11′N 72°49′–74°08′E, is bounded in the north by Batagram and Kohistan, in the east by the Muzafarabad district of Azad Jammu and Kashmir, in the south by Abbottabad and Haripur, and in the west by Swat and Kala Dhaka. The mountain ranges that enter Mansehra district from Kashmir are offshoots of the great Himalayan range. The district has a seasonal temperature range of 2–36 °C (Mustafa 2003).

Sporisorium Ehrenb. ex Link is the largest genus of smut fungi and is represented by 327 species (Vánky 2011, Denchev et al. 2013), of which 18 species have been recorded previously from Pakistan (Ahmad et al. 1997, Vánky 2007, Denchev et al. 2013).

Materials & methods

Freshly collected infected flowers/spikelets of *Digitaria ciliaris* were examined under a stereomicroscope. For light microscopic observation spores were mounted in lactophenol on glass slides and gently heated. Preparations were observed under a Nikon YS 100 microscope and photographed with the help of Digipro-Labomed. Spore

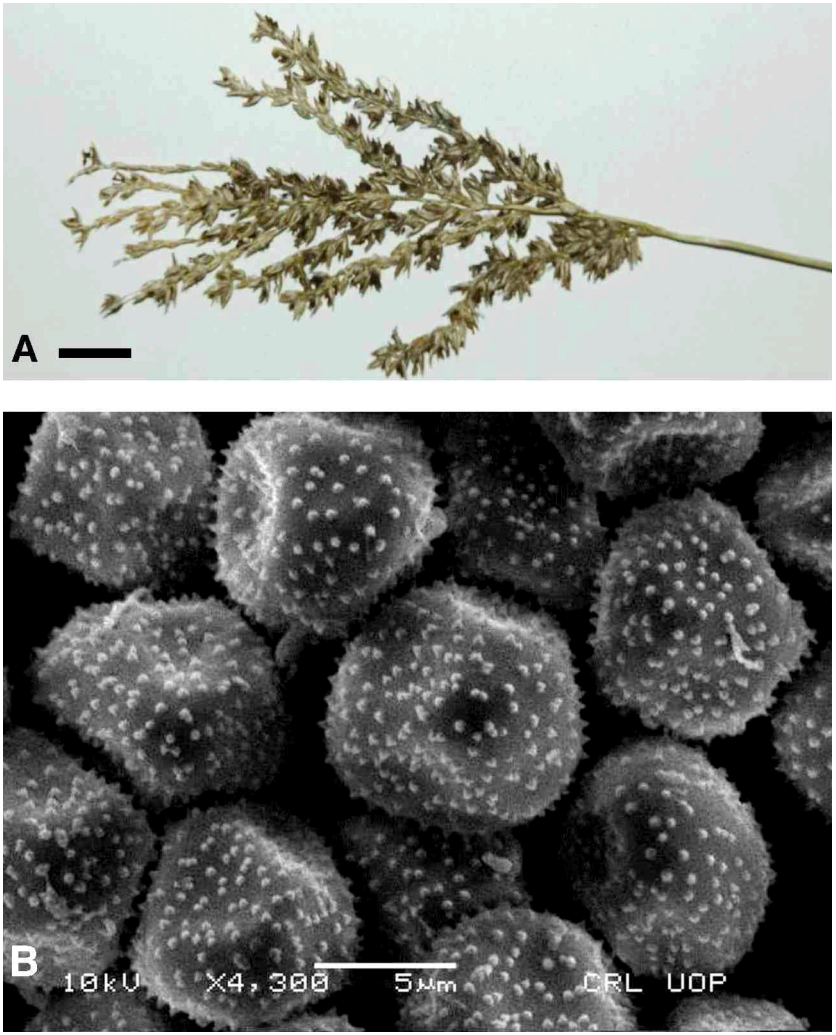

Fig. 1: *Sporisorium linderi* on *Digitaria ciliaris*. A. Infected inflorescence of the host plant. B. Spores in SEM. Scale bars: A = 1.2 cm; B = 5 µm.

measurements were taken by using an ocular Zeiss Eye Piece Screw Micrometer. For SEM, the spores were critically point dried, attached to specimen holders by double-sided adhesive tape, and coated with a 50 nm film of gold in a Polaron E5300 freeze drier. The gold-coated stubs were observed and photographed in a Camscan 3-30BM Scanning Electron Microscope.

Taxonomy

Sporisorium linderi (Zundel) Vánky, Mycotaxon 73: 142, 1999. Fig. 1

Sori in most of the spikelets of the inflorescence, mostly the basal spikelets are infected, sub-globoid to cylindrical, 1.7–3 mm long, initially covered by a thick peridium of the host origin which flakes away irregularly, exposing dark brown powdery spore mass and a well developed central columella, branched at tip, spore balls composed of loosely arranged cells. Spores globose to subglobose or ovoid to irregular, light olivaceous brown to somewhat darker, 7–9.2 × 8.2–10.4 µm, wall up to 0.7 µm thick, moderately to densely echinulate in LM, sparsely echinulate in SEM. Sterile cells either occur singly among the spores or in groups or chains, usually larger than the spores, hyaline, walls up to 0.4 µm thick, smooth.

Specimen examined — On leaves of *Digitaria ciliaris* (Retz.) Koeler: **PAKISTAN**, **Khyber-Pakhtunkhwa**, Mansehra, Durbund, ca. 600 m, 3 Sep. 2010, M. Fiaz FS-24 (HUP 304).

Comments: *Sporisorium linderi* is known from central and southern Africa on several *Digitaria* spp., including *D. ciliaris* (Vánky et al. 2011). This is the first record of its occurrence in Asia. Previously, ~50 % of the known *Sporisorium* species have been reported from Asia. This is the first report of a smut fungus on *Digitaria ciliaris* in Pakistan (Ahmad et al. 1997, Vánky 2011).

Acknowledgements

We sincerely thank Dr. Kálmán Vánky for his help in identification of the fungi and Dr. C.M. Denchev (Institute of Biodiversity and Ecosystem Research, Bulgarian Academy of Sciences) and Dr. Najam-ul-Sahar Afshan (Centre for Undergraduate Studies, University of the Punjab, Lahore) for their valuable suggestions to improve the manuscript and acting as presubmission reviewers.

Literature cited

Ahmad S, Iqbal SH, Khalid AN. 1997. Fungi of Pakistan. Sultan Ahmad Mycological Society of Pakistan, Lahore.

Denchev CM, Fiaz M, Denchev TT, Ahmad H, Khalid AN. 2013 ["2012"]. Additions to the smut fungi of Pakistan. 1. Mycotaxon 121: 165–170. http://dx.doi.org/10.5248/121.165.

Mustafa G. 2003. Mansehra, an introduction. Gazetteer of the Hazara District.

Shah GM, Khan MA. 2006. Check list of medicinal plants of Siran Valley Mansehra - Pakistan. Ethnobotanical Leaflets 10: 63–71.

Vánky K. 2007. Smut fungi of the Indian Subcontinent. Polish Botanical Studies 26: 1–265.

Vánky K, Vánky C, Denchev CM. 2011. Smut fungi in Africa – a checklist. Mycologia Balcanica 8: 1–77.

Vánky K. 2011 ["2012"]. Smut fungi of the world. APS Press, St. Paul, Minnesota, USA, xvii + 1458 p.